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Quick Calculation Method for Fluid Flow Through Duct Systems

Conditions for subsonic compressible flow through duct systems can be quickly and easily calculated using a compact series of curves showing dimensionless parametric functions of Mach number and specific heat ratio. Programming compressible flow duct system problems for computer solution involves expensive, time-consuming preparation of computer inputs and program checkout. The expense can often be avoided by using the curves developed. Accuracy is equivalent to that obtained with a slide rule, and the results can later be used to verify computer solutions.

The curve method is directly applicable to the analysis and design of compressible flow systems in any industrial field or process. Typical examples include: (1) pneumatic supply systems in shops, laboratories and test facilities; (2) pressurized fluid delivery systems onboard ships, airplanes, and space vehicles; (3) high velocity air conditioning systems; (4) vent and vacuum exhaust systems; (5) natural gas transmission lines; (6) gas combustors and heat exchangers; and (7) any gas transport system where sizable pressure drops are encountered.

Effective application of the method described requires a familiarity with one-dimensional compressible flow theory.

Note:

Requests for further information may be directed to:

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Patent status:

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